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ABSTRACT

The major hypothesis was that students whose teachers received training in the use of media would attain higher mean achievement scores than students whose teachers received no media training. Testing of third-grade students in reading, language arts, arithmetic, and intelligence did not support the hypothesis. However, teachers who had been trained in the use of media did use them more and were more favorable toward their use. The utilization and attitude findings were determined by questionnaires and observations. The results of the study are judged inconclusive, and questions are raised about the correlation between total learning and that learning sampled by standardized achievement tests. (JK)

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EVALUATION REPORT

MEDIA UTILIZATION PROJECT

A Joint Project of the Division of
Educational Media and the Comprehensive
School Improvement Project

North Carolina State Department of Public Instruction

March 30, 1971

EM008 810

Participating Schools
With Number of Classes

Experimental		Control	
School	Number of Classes	School	Number of Classes
Washington Street Elementary Plymouth, North Carolina	4	Reeds Elementary Lexington, North Carolina	3
Hampton Elementary Greensboro, North Carolina	3	North Rowan Primary Spencer, North Carolina	4
Elon College Elementary Elon College, North Carolina	3	Abernethy Gastonia, North Carolina	3
Weaverville Primary Weaverville, North Carolina	4	H. B. Sugg Farmville, North Carolina	3
Drexel Primary Drexel, North Carolina	3	Rockford Street Mt. Airy, North Carolina	3

Background and Analysis

In the summer of 1969, the Comprehensive School Improvement Project (CSIP) and the Division of Educational Media began planning a cooperative project designed to test pupil cognitive learning resulting from specialized training in the use of audiovisual techniques and equipment. The rationale for this project implied that, as a result of training in the utilization of media, teachers would become more effective in using equipment presently available in their school situations.

CSIP schools were deemed appropriate for this project since they were currently involved with various approaches to team teaching. In addition, previous surveys had shown that utilization of audiovisual equipment formed a significant portion of the duties of the teacher aide. (Aides are provided for each CSIP team from CSIP funds.)

In planning for this project, it was assumed that a "typical" school does not obtain maximum effectiveness from its media equipment. The training was designed to increase media utilization which would result in increased learning on the part of students. It was anticipated that project schools would increase their holdings of media materials, but not equipment, as one result of this experiment. Given these considerations, it was expected that the actual training would vary, depending upon expressed teacher needs, as well as upon each school's media situation.

Although media utilization was the focus of this experiment, the outcome of increased usage was not considered to be a sufficient measure of the success of the endeavor. Instead, the outcomes in terms of student learning were selected as being more significant. Thus, the major hypothesis for this study was that students whose teachers received training in the utilization of media would attain higher mean achievement scores than control students. Two secondary hypotheses were tested. It was hypothesized that, as a result of the training, experimental teachers would: 1) increase their effective usage of audiovisual equipment and materials, and 2) demonstrate an improvement in attitude toward the use of audiovisual techniques. An additional consideration was an evaluation of the training procedures.

Prior to the opening of school in September 1969, ten CSIP schools with third-grade teams were chosen as possible participants. All ten readily agreed to cooperate. In October 1969, all third-grade pupils were tested with the Science Research Associate's Primary Mental Abilities Test. Schools were assigned to pairs matched on the basis of these intelligence scores. In none of the five pairings were there any significant differences as measured by the PMA test results. One member of each pair of schools was randomly selected to receive the media training, while the matched school provided the control component.

Prior to beginning the training, all students were tested for achievement by Form D of the Science Research Associates' Achievement Test. This yielded a set of pretest scores. Immediately following this testing, the training sessions were begun. Each experimental school received a minimum of three visits from a

consultant in the Division of Educational Media. Although original plans called for the training to be completed by February 1971, personnel limitations and scheduling difficulties made it necessary to extend the training throughout the duration of the project. Each inservice session was approximately one-half day in length and was conducted during the working day at the school. Among the topics considered during these training sessions were: transparency production, use of the sixteen millimeter movie projector, use of filmstrips, and the application of audiotape directions to individualized instruction. At the first session the use of available local resources was considered. The subject-matter orientation of the training sessions was secondary to utilization techniques, i.e. the examples were not directed toward previously selected third-grade subjects.

Following the training, both the experimental and control students were tested with Form C of the SRA Achievement Test in May 1970. At the same time, all teachers (and principals) who attended the training sessions responded to a questionnaire designed to assess the secondary outcomes of the project. After the final testing phase of the project was begun, teachers of the control groups were informed of their role in this project and were brought to Raleigh for a one-day workshop during which they were given training somewhat comparable to that provided the experimental group during the year.

The experimental design for testing the major hypothesis (of student achievement) was a modification of the pretest-posttest control group design. As mentioned earlier, schools were matched on the basis of intelligence scores. Since it was not possible to randomly assign students to the experimental and control groups, analysis of covariance was used in order that initial differences on the achievement test could also be considered. For the analysis of covariance, all scores were entered into the Manova Program of the UNC Computer Library. The composite posttest score from Form C of the SRA Achievement Test was used as a single criterion variable. The three major subscores of the pretest (Form D) were treated as covariates. Although schools had been matched on intelligence, the scores from the PMA test were also entered as a covariate. Thus, the analysis considered four covariates: reading, language arts, arithmetic, and intelligence, and a single criterion. The two secondary hypotheses (increased utilization and attitude) were evaluated by questionnaire results and observations.

Complete sets of scores were obtained for 775 students - 440 experimental and 335 control. The means and standard deviations for this group are presented in Table I. The experimental group's mean on the posttest (criterion) exceeded the mean for the control group by 3.04.* However, when initial achievement differences were taken into account by analysis of covariance, the control group's mean exceeded that of the experimental group by 3.83 (see adjusted criterion in Table I). These differences, though small, are shown to be statistically significant by the results presented in Table II (F Test for Treatment). The ultimate difference favored the control group by 3.83 raw score points. Thus,

*All scores used for this analysis were raw scores.

the covariance analysis indicated that if the groups had been originally equal (equal on the achievement as well as the intelligence pretest) the control group would have exceeded the experimental by almost four points.

The second F Test in Table II was also significant. This test for regression indicated that the original differences in achievement were more than would be expected by random assignment. The regression coefficients presented in Table III provide an approximation of the effects of each of the separate covariates. These coefficients indicate that the pretest reading and math scores were responsible for most of the differences. The low (.08) coefficient for intelligence was to be expected since the groups were originally matched on intelligence.

Table IV contains the direction and amount of adjustment made on the posttest score by the combination of all covariates. It is notable that the majority of the adjustments for the control schools were positive, while adjustments for the experimental schools were generally negative. The average adjustment for all ten schools was 17.5 raw score points.

Given these results, the major hypothesis of student achievement gains could not be supported. Statistically, the results indicate that the training had a slightly negative effect on achievement as measured by the SRA Achievement Test. From a practical standpoint, these results could be judged inconclusive. Four raw score points out of two hundred is a very small difference. Most test conversion tables are not sensitive to differences of this degree. A comparison of these differences with the average adjustment of 17.5 points indicates that a replication of this project with a different assignment of schools to treatments might well yield insignificant results.

Selected portions of the questionnaire data are presented in Tables V, VI and VII. Tables V and VI reveal generally positive attitudes toward the use of media. Three-fourths of the respondents indicated that their schools had increased utilization of media, and almost as many reported changed teaching practices as a result of the project. All respondents recognized that media can be of considerable help in the individualization of instruction, and ninety percent judged the demonstrations applicable for their classroom situations. These tables can be summarized as generally supportive for the secondary hypotheses of increased utilization of media and improved attitude toward use of media.

The responses directly related to evaluation of the training procedures (Table VI) were not as consistent as the responses noted above. Seventy-five percent indicated a need for more training time. Thirty-five percent indicated a need for more materials, while another thirty-five percent found no difficulty in obtaining materials. Perhaps indicative of the tone of these responses (except for the item concerning the amount of time) is that sixty-five percent felt better informed about newer technological developments.

Conclusions and Recommendations

In the opinion of the writer, the results from this study are best judged inconclusive. The slightly positive questionnaire responses fail to offset the negative results in the major analysis. Further consideration of the relationship between media training and utilization would be more productive if more were known about the correlation between total learning and that learning sampled by standardized achievement tests. The appearance of the reading score as the single most important covariate raises a question concerning the applicability of the achievement criterion which was employed. Some of the activities suggested in the training sessions were employed as a substitute for reading for information. This is not a suggestion that achievement is not the proper criterion - it is. The question being raised is rather "How much of the achievement measured by our instruments is separable from reading?".

The results of the project indicated a definite need for more training time. In addition, it would appear that the project could have been improved by relating the training more directly to the achievement of students. Designers of future studies in the area of media might wish to consider developing achievement-oriented curriculum as an integral part of the training. Since many librarians and media specialists in the schools are highly competent, more positive results might have been yielded had they been assigned some of the responsibility for the training.

The project could have progressed more rapidly and fully had better scheduling been implemented and more manpower allotted to the time-consuming task of test scoring. This would have increased the amount of time between the training of teachers and the final testing of students.

The foregoing comments are not meant to be suggestive that this project was without value. The project yielded positive gains in attitude and utilization as measured by the questionnaire responses. It is unfortunate that time limitations precluded assessment of any possible long-range outcomes.

Table I

Means and Standard Deviations for Criterion and Covariates

			COVARIATES				CRITERION	
	Number		I.Q.	Reading	Language Arts	Math	Post Test	Adjusted Post Test
Experimental	440	Mean	104.41	42.77	70.25	46.65	192.82	189.87
		Standard Deviation	26.11	14.82	20.28	17.90	52.40	
Control	335	Mean	106.84	40.39	68.06	44.40	189.78	193.70
		Standard Deviation	25.49	13.01	17.28	16.37	49.01	

Table II

Analysis of Covariance for Experimental and Control Schools

Source of Variation	Degrees of Freedom	Sum of Squares	Mean Square	F
Treatment	1	2637.0	2637.0	7.75*
Regression	4	1745751.0	436437.8	1281.96*
Within	769	261802.0	340.5	

*Significant at .01 Level

Table III

Regression Coefficients for Covariates

I.Q. = .08
Reading = 1.41
Language Arts = .62
Math = 1.02

Table IV

Comparison of Covariance Adjustments Between
Experimental and Control Schools

Experimental					Control				
School	N	Post test	Adjusted* Post test	Adjustment	School	N	Post test	Adjusted* Post test	Adjustment
11	91	220.9	195.8	- 25.1	86	84	222.5	202.1	- 20.4
12	78	226.7	190.6	- 36.1	80	74	183.7	183.9	+ 0.2
01	84	191.2	180.4	- 11.1	29	74	182.5	188.3	+ 5.8
94	89	185.2	188.2	+ 3.0	36	62	168.6	191.4	+ 22.8
41	76	168.6	191.4	+ 22.8	74	63	173.2	200.7	+ 27.5

*See Table III for Regression coefficients of the four covariates

Table V

Selected Responses Indicating Attitude
Toward Use of Audiovisual Materials

Please check the word which most accurately reflects your use of audiovisual materials:

Prior to Training		Since the Training	
Considerable	79%	Considerable	89%
Some	16%	Some	11%
Limited	5%	Limited	
None		None	

Has your school increased its usage of audiovisual materials? (from outside sources)

Yes	75%
No	25%

Does your school now have available, as a result of this training, more software that is usable in direct classroom teaching?

Yes	67%
No	33%

Have you changed any of your teaching practices (methods) as a result of this training?

Yes	71%
No	29%

Have you used any of the techniques recommended by representatives of the State Department for evaluating pupil progress?

Yes	70%
No	30%

Was this a new practice for you?

Yes	50%
No	8%
No Response	42%

Table VI

Selected Responses Indicating Attitude
Toward Use of Media

In your opinion, how much help can the new educational media provide for a primary school focusing on individualized instruction:

Considerable help	100%
Some help	0%
Limited help	0%
No help at all	0%

How would you rate your students' response to (your) use of audiovisual materials and techniques?

Excellent	47%
Average	53%
Below average	0%
Undecided	0%

Have you, as a result of this training, been able to identify new school or classroom needs for audiovisual equipment or materials?

Yes	74%
No	26%

Were most of the materials used for demonstration by State Department personnel suited to your third-grade classroom situation?

Yes	90%
No	10%

Do you think that mailed instructions could have increased the effectiveness of this training?

Yes	24%
No	38%
Undecided	38%

Table VII

Responses to Prepared Statements
Describing the Media Utilization Project*

Percent Responses	
25%	The amount of training time was adequate
75%	There was not enough contact time with personnel from the State Department of Public Instruction
35%	There was no particular difficulty in obtaining satisfactory materials for classroom use
35%	The limited amount of materials, furnished from State sources, handicapped this training
100%	The teacher was allowed "freedom" to plan her own program of media utilization
0%	Too much responsibility was placed on the individual teacher for media utilization
90%	Most of the techniques demonstrated during this training could be applied to third-grade classes
05%	The application of this training to actual classroom situations was not clear
60%	The State Department consultant was effective in communicating with the participants
0%	The State Department consultant did not seem to understand problems that actually exist in the field
65%	I am nowbetter informed about new technological developments in audiovisual education
20%	There was very little new or unknown in any of these presentations
15%	The times selected for the training sessions were inconvenient
50%	The training times selected fitted in well with the school day

*Percentage totals will not add to 100% since more than one response was allowed